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Effects of weld parameters on the grain refinement in AISI 430 FSS welds

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Abstract : Ferritic stainless steels (FSS), in general, and the first generation of the group 430, in particular, are associated with many problems during the welding process. These problems are the grain growth, both in the fusion zone (FZ) and heat affected zone (HAZ) and martensite formation at grain boundaries of the weld. The grain growth of ferrite at high temperature and the presence of martensite are that resilience at ambient temperature is generally low, so that the assembly becomes susceptible to fragile fracture. The grain size can be reduced by accelerating the thermal cycle, or by reducing the energy input during the welding process. The aim of the work is, first to characterize the microstructure of welds steel (AISI 430) as variable parameters and then optimize its own parameters. We focused on improving refining the grain size of ferritic stainless steel (AISI 430) during the TIG welding (Tungsten Inert Gas). The results obtained in the present study show that, the microstructural characteristics of the weld are influenced by the current and the welding speed and beyond a critical value of current, speed has no influence.

Keywords : Welding parameters, TIG, ferritic stainless steel, Grain Size